

## **Variation in Agricultural Practice between Tribal and Non-Tribal Population in Jangal Mahal Blocks of Bankura District: A Case Study of Sarenga and Simlapal Blocks.**

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**Abstract:** *The study region is South Bankura, West Bengal, where 79.44% people are directly engaged with agricultural production. Among them 26.86% are tribes. In general observation the nature of farming practice of tribes does not vary much more from non-tribal groups particularly in this geographical location. But yield of production of different crops are not same for tribal and non-tribal farmers. A set of physical and non-physical factors are responsible for this. It is believed that, among all these factors soil management including fertilizer usage is the prime important factor of production. So, in our intensive primary data based study the effort has been given to draw out the exact nature of soil management, fertilizer usage for particular crops in particular soil in the study region with a tribal and non-tribal comparison. A sharp difference of cropping intensity exists in the tribal and non-tribal farm land also. Lack of capital investment due to economic compulsion and low aspiration of life are the prime most important cause in this regard. Here we consider the soil fertility because fertility is a good reflection of soil management. Out of 32 soil samples (collected before Kharif and Ravi Cultivation) average percentage of Organic Carbon, Available P<sub>2</sub>O<sub>5</sub>, and Available K<sub>2</sub>O is poor in the tribal farm lands than non-tribal lands with some exception. In this connection texture and pH are also considered. Only 25% tribal farm lands show better soil fertility in Pre-Ravi season. Low amount of bio and chemical fertilizer usage, improper usage of fertilizer, lack of crop rotation are responsible factors in this regard. Collected samples before Kharif show high amount of available nutrient in the soil in every place due to residual fertilizer of Ravi season particularly those fields where potato was cultivated. In some cases it is abnormally high. It is also interesting to note that pH value of the soil is affected by fertilizer usage in this region. We further analysed the fertilizer usage for particular crop in particular plot from where soil samples were collected before Kharif and Ravi season. 'Sarna' and 'IR-36' paddy is only crop in Kharif season and usage of fertilizer is lower than the recommendation level. In case of non-tribes it is at par recommended level in 62.50% plots, high in 12.5% plots and low in 25% plots. In Ravi season 'Joyti' Potato and 'B-9' Mustard is the dominating crop. The usage of fertilizer in Potato field is quite high for non-tribes and quite low for tribes. This difference also observed in Mustard field also but in a low gap. Traditional pattern of agricultural practice is going to change day by day. Tribal indogenous knowledge felt a gap with this advancement due to lack of proper scientific knowledge. Though there is a considerable influence of non-tribal farmer on tribes particularly in this region. In this paper cropping intensity, Soil fertility and fertilizer usage are analysed in detailed. Everywhere we have seen a gap between tribes and non-tribes. Non - acceptance of modern knowledge, low aspiration in life and lack of investment arrested the development of tribal agriculture. In one hand low yield of production and on the other loan from money lenders compress farmer's life from both side resulting further low yield and poor farmers rotated around a poverty circle, it is also true for small non-tribal farmers. Though the agriculture of this region is mainly subsistence in nature but Potato, Mustard, Sunflower, Til crops in Ravi and Pre Kharif season are highly commercialized. Over utilization of fertilizer is also observed in the field of said crops particularly where cropping intensity is high resulting soil acidity and other numerous qualitative and micro-biological problem in the soil. For searching a sustainable and more profitable agriculture, Department of Agriculture, Government of West Bengal and Researchers/NGOs should be worked together. We are hopeful because there is a wide gap between potentiality and actual amount production which may be matched through some basic infrastructural and perceptual change.*

**Key Words:** *Agriculture, Cropping Intensity, Fertilizer, Gram Panchayat (G.P), Nutrients, Soil Management, Subsistence, Tribe,*

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## I. Introduction

Jangal Mahal (Forested Part of South-Western part of West Bengal) is one of the tribe rich area comprises with 26.86% tribal population. According to the Brundtland Commission's categorization of agricultural systems (WCED, 1987), Tribal agriculture is Low Resource or Resource-Poor Agriculture, characterized by small farm units, fragile soils, rain dependency and minimum inputs. Indian tribal agriculture belongs to this category. But in this region tribes and non-tribes are resides side by side in a same village or in neighbouring village and location of farm lands of both population groups lies in a same geographical location. So there is a considerable influence of non-tribal groups on tribes. Tribal societies have evolved location-specific local knowledge gained practicing a unique lifestyle, having a unique set of cultural and religious beliefs through close interaction within natural and physical environments and cultural adaptation, which are now recognized to be more eco-friendly and sustainable. Up to the 1980s, these tribal farmers were considered laggards. Those days however, the increasing attention and scientific research have made it possible to recognize such farmers as innovators based on their unique practices in the field of sustainable agriculture. (K. Anil Kumar, 2010). Post liberalization change is significant in the Jangal Mahal of Bankura district and recently special emphasis is given for rapid development from both Central and State government due to its Left Wing Extremist movement up to 2011. Four Blocks namely Sarenga, Simlapal, Raipur and Ranibadh are Left Wing Extremists affected Blocks (LWE Blocks). Among these four Blocks two Blocks (Sarengal and Simlapal) are undertaken for the study (Map No.-1). In general observation the nature of farming practice of tribes does not vary much more from non-tribal groups particularly in this geographical location. But yield of production of different crops are not same for tribal and non-tribal farmers. A set of physical and non-physical factors are responsible for this. It is believed that, among all these factors soil management including fertilizer usage is the prime important factor of production. So, in our intensive primary data based study the effort has been given to draw out the exact nature of soil management, fertilizer usage for particular crops in particular soil in the study region with a tribal and non-tribal comparison.

Some research questions are important in this regard. Firstly, the nature of tribal farming how much differs from their non tribal neighbour? Secondly, which factors are necessarily important for low yield in the tribal agriculture than non-tribes? Thirdly, tribal farming is how much influenced by modern knowledge?

To satisfy the objectives the paper is divided into **three sections**.

**Section one** deals with cropping intensity and the yield of production of different crops in Kharif and Ravi season among tribal and non-tribal farmer.

**Section two** analyse the soil management of the tribal and non-tribal farm land with particular reference to soil fertility.

Detail analysis of fertilizer usage for specific crop and soil (Crop-Plot analysis) is incorporate in section **three**. The study necessarily ends with conclusion.

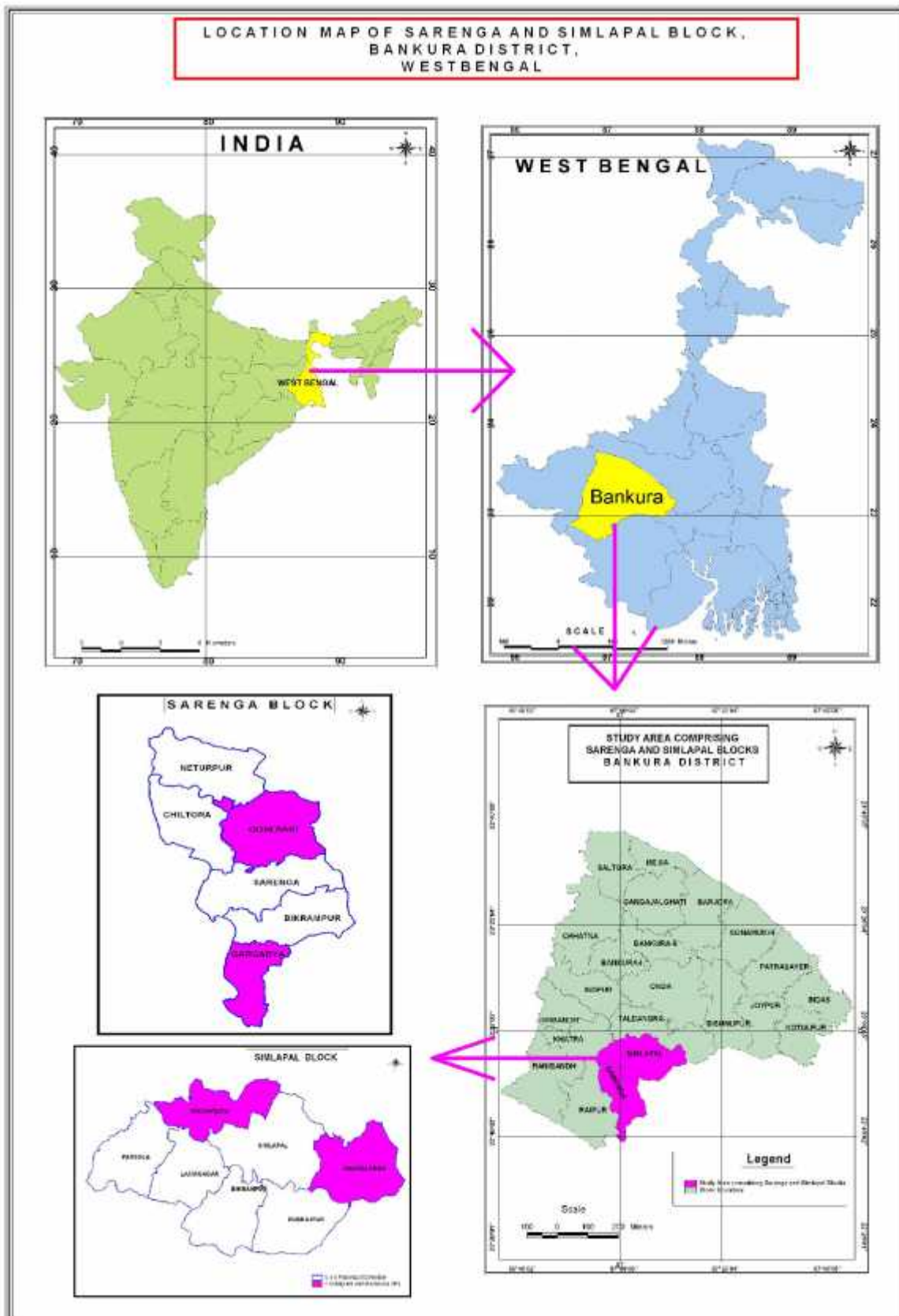
## II. Methodology

The methodology of this type of work is highly significant because the entire study is depends on primary data. The methods of data collection follow the rules of sampling. Two Blocks of South Bankura are under our study. (Sarenga and Simlapal). At first we will select our micro study area in the following method-

- a.) From each Block two Gram Panchayats (G.P.) are selected based on cropping intensity assuming it is one of the major indicator of progressiveness of agriculture. One should be highest cropping intensity and another should be lowest one.
- b.) From each G.P two mouzas of high and low cropping intensity are selected where tribal farmers must reside. So eight mouzas form two Blocks are selected for micro study.
- c.) Two soil samples are collected from each mouza, one from Tribal farm land and another for Non-Tribal farm land in Kharif and Ravi season. This selection is purely random basis. Then samples are tested in the laboratory to understand soil fertility, crop selection and relevance of fertilizer application etc.
- d.) Those farmers are interviewed through structured questionnaire whose farm land is undertaken for soil sample collection.

Through structured questionnaire different socio-economic influencing factors of agriculture and livelihood are identified. Secondary data from the Department of Agriculture, District Census Book is incorporated in some cases. For landscape study Survey of India Topo sheet and IIRS Satellite data has been taken.

Map No.-1.



Section: 1.

It is previously mentioned that two Gram Panchayat (G.P) are selected from each Blocks, one has the highest and another has the lowest cropping intensity assuming that the cropping intensity is one of the major indicator of agricultural progressiveness. So for the better understanding of the phenomena the cropping intensity of different Gram Panchayat (G.P) under both Blocks are tabulated below (Table No.1). Gargaria G.P of Sarenga Block and Mondal Gram G.P. of Simlapal Block depict highest cropping intensity probably due to their river bank location with fertile alluvium soil and shallow ground water table. Gargaria is located on the bank of Kasai River and Mondalgram is on the bank of Silabhati River. On the otherhand Goalbari G.P. of Sarenga and Machatora G.P. of Simlapal Block associated with interior location, unfertile lateritic soil with water scarcity depicts lowest cropping intensity (Map No.-2). A great variation is observed among the different mouzas even in same G.P. It is mentioned in table No.-2. The difference of cropping intensity between highest and lowest mouzas in Gargaria G.P of Sarenga Block is 164.95 and for Goalbari G.P of same Block is 87.87. In case of Simlapal Block the difference is higher than Sarenga Block. Mondal Gram G.P and Machatora G.P show the figure 188.47 and 192.55 respectively. To understand the real variation of cropping intensity involving all mouzas of the G.P the Standard Deviation (S.D) is a good measure. The Mean and Standard Deviation of the G.Ps are tabulated below (Table No.- 3 & Fig-1)). From the table it is clear that the values of S.D for all G.Ps are more or less similar except Goalbari G.P of Srenga Block. Goalbari G.P of Srenga Block has low cropping intensity but the crop coverage of different mouzas maintains a homogeneous picture because soil condition, relief- topography, irrigation facilities does not vary to a large extent throughout the G.P. Gargaria G.P. of Sarenga has highest cropping intensity (249.10) not only within the Block but also highest in the region mainly due to its river bank location with fertile alluvium soil except some mouzas of interior location with undulating topography exhibit low cropping intensity. So the range is comparatively (164.95) high and S.D and C.V are moderate (54.01& 22.13). Others two G.Ps of Simlapal Block namely Mandalgram & Machatora (Highest & Lowest cropping intensity G.P) show more variation among the mouzas. In Machatora G.P different portions are covered by hard laterite and some portion has rough topography where agriculture is too difficult. Naturally there is a greater variation exist among the mouzas. On the other hand Mondalgram G.P is a good agricultural zone but vegetable cultivation is restricted within river bank side location. A sharp difference of cropping intensity exists in the tribal and non-tribal farm land also. From sample data it is calculated for tribes 102.55 and for non-tribes is 170.93. Lack of capital investment due to economic compulsion and low aspiration of life are the prime most important factor in this regard.

**Table – 1.**  
**Cropping Intensity of Different Gram Panchayat Under Sarenga & Simlapal Blocks. Year-2014.**

Block	G.P	Kharif (Hec)	Ravi (Hec)	Pre Kharif (Hec)	Gross Cropped Area (Hec)	Net Cropped Area (Hec)	Cropping Intensity	Remarks
Sarenga	Naturpur	1830	580	394	2904	1918	151.40	
Sarenga	Chiltor	2761	1015	776	4552	2947	154.46	
Sarenga	Goalbari	1969	437.3	313.2	2719.5	2207	123.20	Lowest
Sarenga	Sarenga	2230	1510	1296	5036	2308	218.20	
Sarenga	Bikrampur	2596	2082	1672	6350	2694	235.70	
Sarenga	Gargarya	1888	1609.1	1358	4855.1	1949	249.10	Highest
Simlapal	Parsola	1677	447.25	1219	3343.25	2413	138.55	
Simlapal	Lakshmisagar	2098	899	883	3880	3172	122.32	
Simlapal	Bikrampur	1703	899	829	3431	2905	118.11	
Simlapal	Machatora	825	730	316	1871	2230	84.00	Lowest
Simlapal	Simlapal	829	1251	947	3027	2495	121.32	
Simlapal	Dubrajpur	1439	1363	1302	4104	3045	134.78	
Simlapal	Mandalgram	2400	1574	660.25	4634.25	3169	146.23	Highest

Source: ADA office Srenga & Simlapal.

**Table – 2. Cropping Intensity of Selected Eight Mouzas From Highest and Lowest Cropping Intensity G.Ps. From Sarenga and Simlapal Block. Year-2014.**

G.P.	Mouza	Kharif (Hec)	Ravi (Hec)	Pre Kharif (Hec)	Gross Cropped Area (Hec)	Net Cropped Area (Hec)	Cropping Intensity	Remarks
Gargaria	Parulia	81.00	81.58	76.33	238.91	84	284.42	Highest
	Sitarampur	65.00	11.11	3.93	80.5	67	119.47	Lowest
Goalbari	Chhotobirbhanpur	97.50	46.30	31.5	175.3	105	166.95	Highest
	Keduadangri	08.00	1.60	0.70	10.3	13	79.8	Lowest
Mondalgram	Boricha	67.00	57.00	55.75	179.75	64	280.86	Highest
	Barakhulia	16.50	18.75	28.50	63.75	69	92.39	Lowest
Machatora	Amakunda	44.00	42.50	26.00	112.5	55	204.55	Highest
	Bhaduldoba	2.75	5.25	1.00	9.00	75	12.00	Lowest

Source: ADA office Srenga & Simlapal.

Table – 3.

Level of Dispersion of Cropping Intensity Within the Selected G.Ps of Sarenga and Simlapal Bolck.- 2014.

Yield of different crops:

Block	G.P	Mean	S.D	Range	C.V
Sarenga	Gargaria	243.97	54.01	164.95	22.13
Sarenga	Goalbari	118.34	20.57	87.15	17.34
Simlapal	Mondalgram	150.27	52.79	188.47	35.13
Simlapal	Machatora	99.85	53.01	192.55	53.09

From detailed field survey a separate estimate of yield of different crops has been made for tribes and non-tribes (Table-4 & Fig.-2). It is true that the tribal agriculture does not vary much more from their nearest non-tribe neighbours in apparent view but intensive investigation tells another story. Through interview we asked the question on capital input, source of capital, fertilizer usage, crop selection, commercialization of surplus crops and perception related questions etc. From this interview a clear cut cause-effect relationship comes out. Three important factors are identified in this regard. These are I) Poor soil management II) Lack of capital investment and III) Low aspiration resulting low surplus. In this paper discussion is restricted within the periphery of soil nutrient management and fertilizer application.

Table – 4. Yield of Different Crops in Tribal and Non-Tribal Farm land. Year-2014.

Crops	Yield. KG/Acre for Tribes	Yield KG/Acre for Non-Tribes
Boro Paddy	1350	1650
Amon Paddy	1350	1500
Potato	7000	9000
Mustard	450	600
Sesame	300	330

Source: Interview of farmers.

Map No.-2.

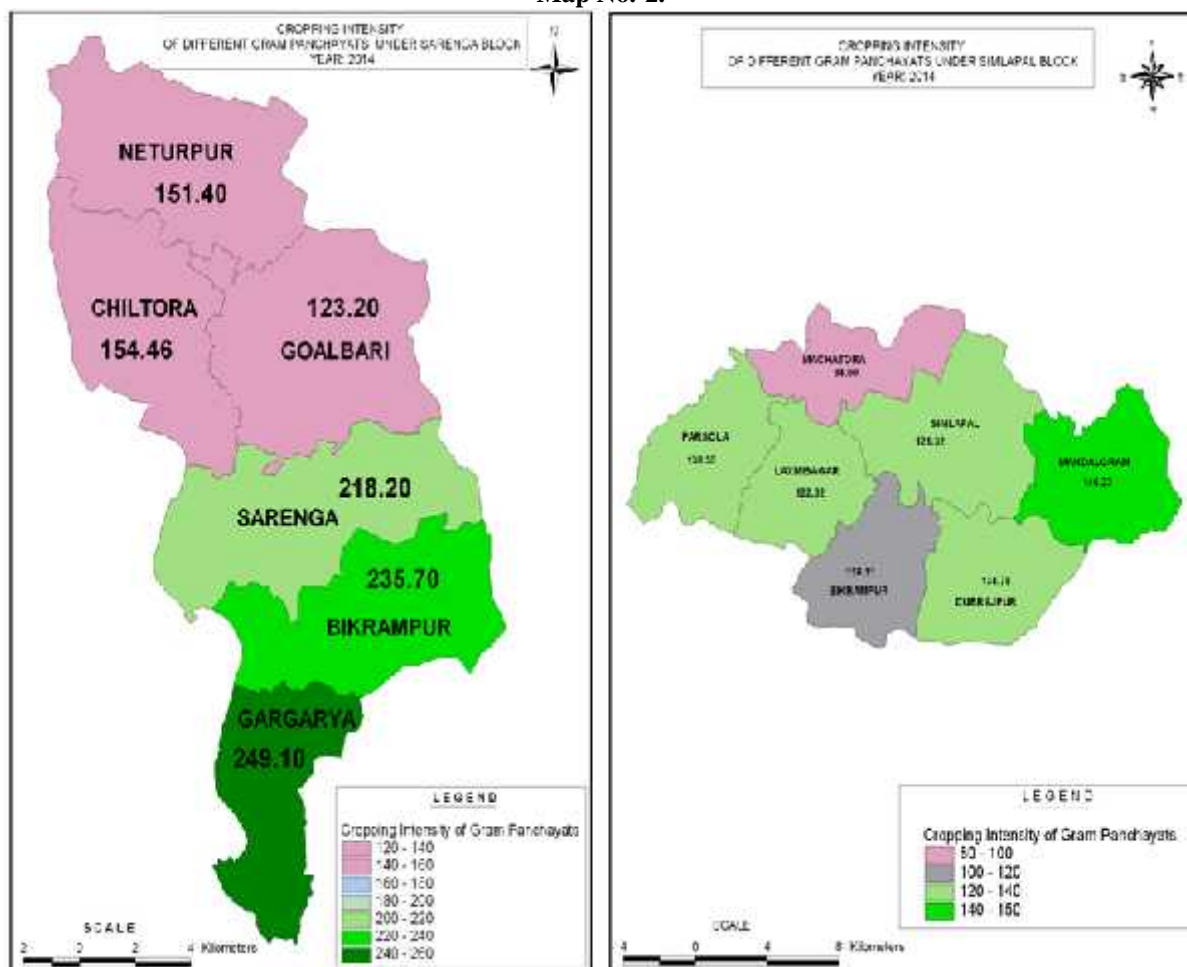


Fig.-1.

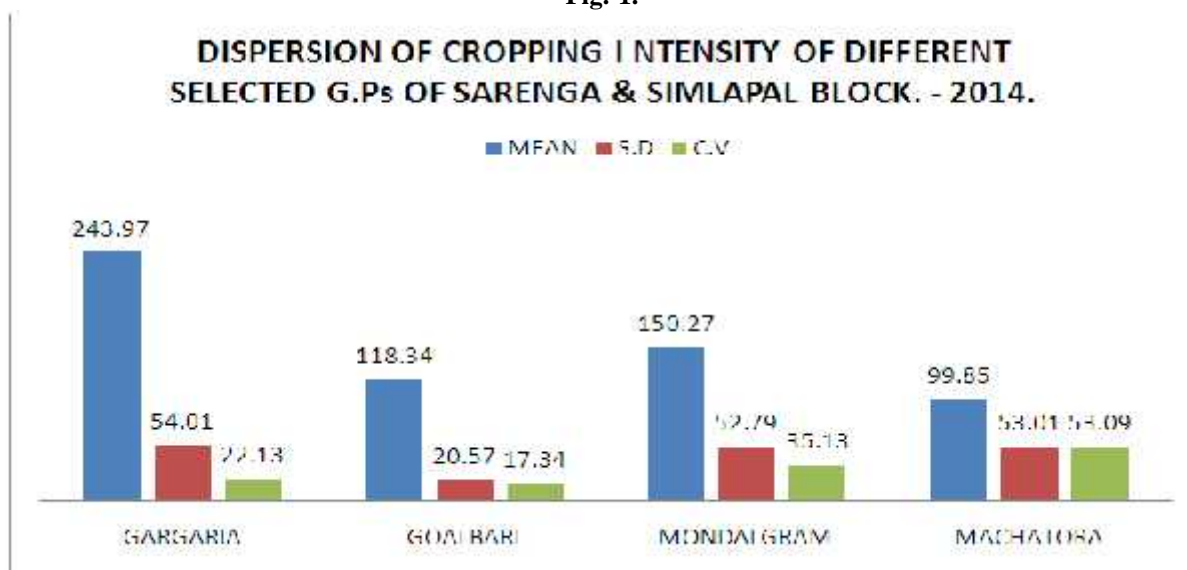
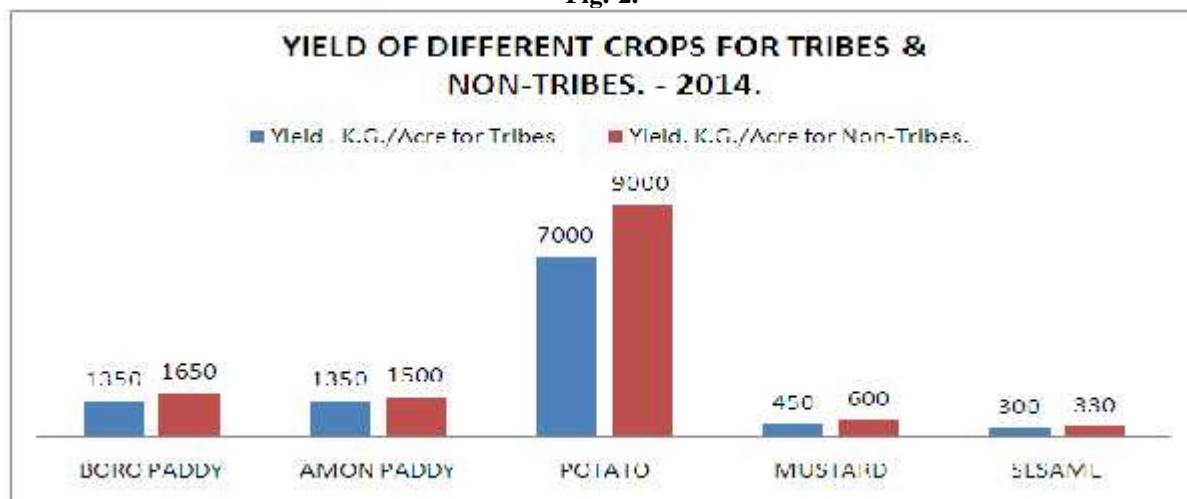


Fig.-2.



## Section: 2.

Low yield of production of tribal farms are associated some physical and non-physical factors which are already mentioned in introductory paragraph. Now we want to correlate the yield of production with soil management and fertilizer application for a comparative study of tribal and non-tribal agriculture.

**Soil management as a factor of production:** It is well established fact that the good soil management is the prime important factor for good production and selection of crops also mostly depends on it. In our study area we want to investigate the role of soil management as a factor of production in tribal and non-tribal society. Soil management is a broad terminology covering so many factors relating to maintaining soil health. Here we consider only the soil fertility because fertility is a good reflection of soil management. Out of 32 soil samples (collected before Kharif and Ravi Cultivation) average percentage of Organic Carbon, Available  $P_2O_5$ , and Available  $K_2O$  is poor in the tribal farm lands than non-tribal lands except some exception. In this connection texture and pH also considered. (Table No.-5 & 6).

Only two samples of tribal land shows better fertility than non-tribe in Pre-Ravi season. So, 75% and 100% non-tribal farm lands show better soil fertility in Pre-Ravi and Pre-Kharif season. Low amount of bio and chemical fertilizer usage, improper usage of fertilizer, lack of crop rotation are responsible factors in this regard. Collected samples in before Kharif show high amount of available nutrient in the soil in every place due to residual fertilizer of Ravi season particularly those fields where potato was cultivated. In some cases (Sample No.-4) it is abnormally high. It is also interesting to note that pH value of the soil is affected by fertilizer usage in this region. A clear negative relationship is observed between available fertilizer and pH value of the soil. In

agricultural soil the amount of available nutrient is mostly controlled by fertilizer usage because some part of the study region decomposed or partly decomposed lateritic clay is found as a thin top cover of soil where Keolinite and Illite minerals are found but the availability of K is low. Similarly available P should be abundant throughout the region because this is an area where rainfall and temperature is favourable for chemical weathering and the physical weathering is encouraged a long rain free hot period. So there is a greater chance to present newly formed aluminium and iron phosphates (amorphous, non crystalline) but in reality average P amount is low. Both K and P are high where cropping intensity is high.

**Table – 5.**  
**Soil Fertility of Tribal and Non-Tribal Agricultural land in Sarenga and Simlapal Block.**  
**(Sample collected Before Kharif Season – 2014).**

Sample No.	TRIBE					Sample No.	NON-TRIBE				
	Texture	pH	% O.C	Available P <sub>2</sub> O <sub>5</sub> /Hec.	Available K <sub>2</sub> O/Hec.		Texture	pH	% O.C	Available P <sub>2</sub> O <sub>5</sub> /Hec.	Available K <sub>2</sub> O/Hec.
1	S-L	6.10	0.392	37.92	40.49	1	S-L	5.82	0.507	48.00	47.42
2	S-L	6.50	0.409	32.40	49.82	2	S-L	5.16	0.877	48.92	60.40
3	L	5.14	0.682	59.91	60.84	3	L	4.95	0.819	75.84	89.91
4	Si-L	5.10	0.580	40.15	66.14	4	Si-L	4.69	0.710	96.72	111.13
5	S	6.92	0.292	26.88	41.97	5	S-L	6.13	0.491	37.97	54.02
6	S-L	6.12	0.319	26.88	35.12	6	L	6.50	0.330	37.54	42.31
7	S	6.42	0.223	24.15	44.17	7	S	6.50	0.402	29.66	43.86
8	Si-L	6.10	0.421	39.42	46.13	8	Si-L	5.92	0.502	42.04	46.07

Source: Field Survey & Lab. Testing. **Note: L=Loam, S-L= Sandy Loam, Si-L=Silt Loam, S=Sandy.**

**Note:**Sample 1 from Chhotobirbhanpur Mouza, Goalbari G.P, Sarenga Block.  
Sample 2 from Keduadangri Mouza, Goalbari G.P, Sarenga Block.  
Sample 3 from Sitarampur Mouza, Gargaria G.P, Sarenga Block.  
Sample 4 from Parulia Mouza, Gargaria G.P, Sarenga Block.  
Sample 5 from Amakunda Mouza, Machatora G.P, Simlapal Block.  
Sample 6 from Bhaduldoba Mouza, Machatora G.P, Simlapal Block.  
Sample 7 from Barakhulia Mouza, Mondalgram G.P, Simlapal Block.  
Sample 8 from Boricha Mouza, Mondalgram G.P, Simlapal Block.

**Table – 6.**  
**Soil Fertility of Tribal and Non-Tribal Agricultural land in Sarenga and Simlapal Block.**  
**(Sample Collected Before Ravi Season – 2014).**

Sample	TRIBE					Sample	NON-TRIBE				
	Texture	pH	% O.C	Available P <sub>2</sub> O <sub>5</sub> /Hec.	Available K <sub>2</sub> O/Hec.		Texture	pH	% O.C	Available P <sub>2</sub> O <sub>5</sub> /Hec.	Available K <sub>2</sub> O/Hec.
1	S-L	6.37	0.390	36.78	40.25	1	S-L	6.12	4.00	36.62	36.44
2	S-L	6.50	0.402	32.50	27.98	2	S-L	5.96	4.52	42.13	44.52
3	L	5.97	0.542	56.55	42.68	3	L	5.92	4.27	62.59	55.76
4	Si-L	6.00	0.475	32.12	41.97	4	Si-L	5.01	4.45	50.96	61.22
5	S	6.43	0.312	28.92	47.92	5	S-L	6.10	4.62	27.11	42.75
6	S-L	6.92	0.310	22.68	26.33	6	L	6.94	4.98	33.52	27.92
7	S	7.00	0.300	22.14	24.12	7	S	6.55	5.41	26.66	32.39
8	Si-L	6.56	0.346	24.96	30.45	8	Si-L	6.44	5.14	40.40	37.82

Source: Field Survey & Lab. Testing. **Note: L=Loam, S-L= Sandy Loam, Si-L=Silt Loam, S=Sandy.**

**Note:**Sample 1 from Chhotobirbhanpur Mouza, Goalbari G.P, Sarenga Block.  
Sample 2 from Keduadangri Mouza, Goalbari G.P, Sarenga Block.  
Sample 3 from Sitarampur Mouza, Gargaria G.P, Sarenga Block.  
Sample 4 from Parulia Mouza, Gargaria G.P, Sarenga Block.  
Sample 5 from Amakunda Mouza, Machatora G.P, Simlapal Block.  
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Sample 7 from Barakhulia Mouza, Mondalgram G.P, Simlapal Block.  
Sample 8 from Boricha Mouza, Mondalgram G.P, Simlapal Block.

### Section - 3.

We further analysed the fertilizer usage for particular crop in particular plot from where soil samples were collected before Kharif and Ravi season. (Table No.-7 & 8). Table 7 shows that in every plot 'Sarna' and 'IR-36' paddy are only crop in Kharif season and usage of fertilizer is lower than the recommendation level.(Fig.-3) In case of non-tribes it is at par recommended level in 62.50% plots, high in 12.5% plots and low in 25% plots. In Ravi season 'Joyti' Potato and 'B-9' Mustard is the dominating crop. The usage of fertilizer in Potato field is quite high for non-tribes and low for tribes. (Table No.-8 & Fig-4). This difference also observed

in Mustard field also but it is not as high as potato.(Table No.-8 & Fig.-5). Ravi crops are mainly commercialized crops and need huge invest mainly for fertilizer purchase. From the interview of different tribal farmers it is clear that lack of invest and low degree of commercialization due to low aspiration in life are the important causes for low fertilizer usage in Ravi season as well as low production. Application of N, P, K fertilizer in potato field is low from recommendation level up to 10 K.G for the tribal farm land but it is high up to 40 K.G for N fertilizer and up to 57 K.G for P and K fertilizer for non-tribal farm land. Though there is a positive relationship is observed with fertilizer usage and yield of production but it is not every time economically viable because the cost of chemical fertilizer is sufficiently high and the cost of potato is very much fluctuating in different year. In the year 2014 we estimate that the extra investment for fertilizer in potato field was Rs. 12,000 per Acre where as the monetary value extra potato production was Rs. 8,000 for non-tribals compare to tribal farming. This type of monetary loss has been observed in different past years when the market price of potato was abnormally low. If we observed the another side, relating to soil health, then it is clearly seen that the pH value of soils are low (acidic) where the fertilizer application is high (Table-5, Sample No. - 1 to 4 and 8). Except the direct impact of pH change so many factors relating to the availability of nutrients in soil, cation exchange capacity and role of micro-organisms are adversely affected with high fertilizer application. Everybody knows that a lot of physical and chemical characteristics are negatively related with high fertilizer usage. This fact is especially true for non-tribe farming in our study region. So analysing all this factors we may say that the tribal farming is more eco-friendly than non-tribes. But in reality in both cases (Tribe and non-tribe) the farming practice is not properly scientific or at par with the recommendations made by the Agricultural Research Department, Govt. of West Bengal Agricultural Research Department. From the experience of field work we have seen that there is a both side communication gap between farmers and Agriculture Department that restricts the diffusion of modern scientific knowledge for agriculture.

**Table-7. Difference of Fertilizer Usage in Kharif Crop (Amon Paddy) between Tribal and Non-Tribal Farm Land. (K.G/Acre).Year-2014.**

Sample No.	Tribe				Non-Tribe				
	Crop	Fertilizer	Recommendation	Difference	Sample No.	Crop	Fertilizer	Recommendation	Difference
1	Paddy IR-36	N-32 P-14 K-14	N-36 P-16 K-16	N-04 P-02 K-02	1	Paddy Red Sarna	N-40 P-15 K-16	N-40 P-15 K-16	N-0 P-0 K-0
2	Paddy Red Sarna	N-34 P-14 K-14	N-40 P-16 K-16	N-06 P-02 K-02	2	Paddy Red Sarna	N-40 P-15 K-16	N-40 P-15 K-16	N-0 P-0 K-0
3	Paddy Red Sarna	N-36 P-15 K-15	N-40 P-16 K-16	N-04 P-01 K-01	3	Paddy IR-36	N-30 P-15 K-15	N-36 P-15 K-16	N-06 P-01 K-01
4	Paddy Red Sarna	N-32 P-12 K-12	N-40 P-16 K-16	N-08 P-04 K-04	4	Paddy Red Sarna	N-40 P-15 K-16	N-40 P-15 K-16	N-0 P-0 K-0
5	Paddy Red Sarna	N-34 P-12 K-12	N-40 P-16 K-16	N-06 P-04 K-04	5	Paddy Red Sarna	N-44 P-19 K-19	N-40 P-15 K-16	N-04 P-03 K-03
6	Paddy Red Sarna	N-38 P-14 K-14	N-40 P-16 K-16	N-02 P-02 K-02	6	Paddy Red Sarna	N-40 P-15 K-16	N-40 P-15 K-16	N-0 P-0 K-0
7	Paddy Red Sarna	N-32 P-12 K-12	N-40 P-16 K-16	N-08 P-04 K-04	7	Paddy Red Sarna	N-40 P-15 K-16	N-40 P-15 K-16	N-0 P-0 K-0
8	Paddy Red Sarna	N-34 P-12 K-12	N-40 P-16 K-16	N-06 P-04 K-04	8	Paddy Red Sarna	N-36 P-12 K-12	N-40 P-15 K-16	N-04 P-04 K-04



**Table – 8.**  
**Difference of Fertilizer Usage in Ravi Crop (Potato & Mustard)**  
**Between Tribal and Non-Tribal Farm Land. (K.G/ Acre) Year-2014.**

Tribe					Non-Tribe				
Sample No.	Crop	Recommendation	Fertilizer	Difference	Sample No.	Crop	Fertilizer	Recommendation	Difference
1	Potato	N-80 P-60 K-60	N-70 P-50 K-50	N--10 P -10 K -10	1	Potato	N-115 P-117 K-117	N-80 P-60 K-60	N-+35 P-+57 K-+57
2	Potato	N-80 P-60 K-60	N-90 P-60 K-60	N-+10 P - 0 K- 0	2	Potato	N-120 P-117 K-117	N-80 P-60 K-60	N-+40 P-+57 K-+57
3	Potato	N-80 P-60 K-60	N-80 P-50 K-50	N-0 P--10 K--10	3	Potato	N-120 P-117 K-117	N-80 P-60 K-60	N-+40 P-+57 K-+57
4	Potato	N-80 P-60 K-60	N-95 P-70 K-70	N +15 K+ 10 K + 10	4	Potato	N-115 P-117 K-117	N-80 P-60 K-60	N-+35 P-+57 K-+57
5	Mustard	N-40 P-20 K-20	N-40 P-20 K-15	N-0 P--10 K--05	5	Mustard	N-50 P-25 K-25	N-40 P-20 K-20	N-+10 P-+05 K-+05
6	Potato	N-80 P-60 K-60	N-80 P-50 K-50	N-0 P--10 K--10	6	Potato	N-120 P-117 K-117	N-80 P-60 K-60	N-+40 P-+57 K-+57
7	Potato	N-80 P-60 K-60	N-80 P-50 K-50	N-0 P--10 K--10	7	Potato	N-120 P-117 K-117	N-80 P-60 K-60	N-+40 P-+57 K-+57
8	Mustard	N-40 P-20 K-20	N-40 P-18 K-15	N-0 P--02 K--05	8	potato	N-120 P-117 K-117	N-80 P-60 K-60	N-+40 P-+57 K-+57

Source: Field Survey and 'Krishi Chainika' book,-Bankura District, Dept. of Agriculture Govt of W.B.

**Fig.-3.**

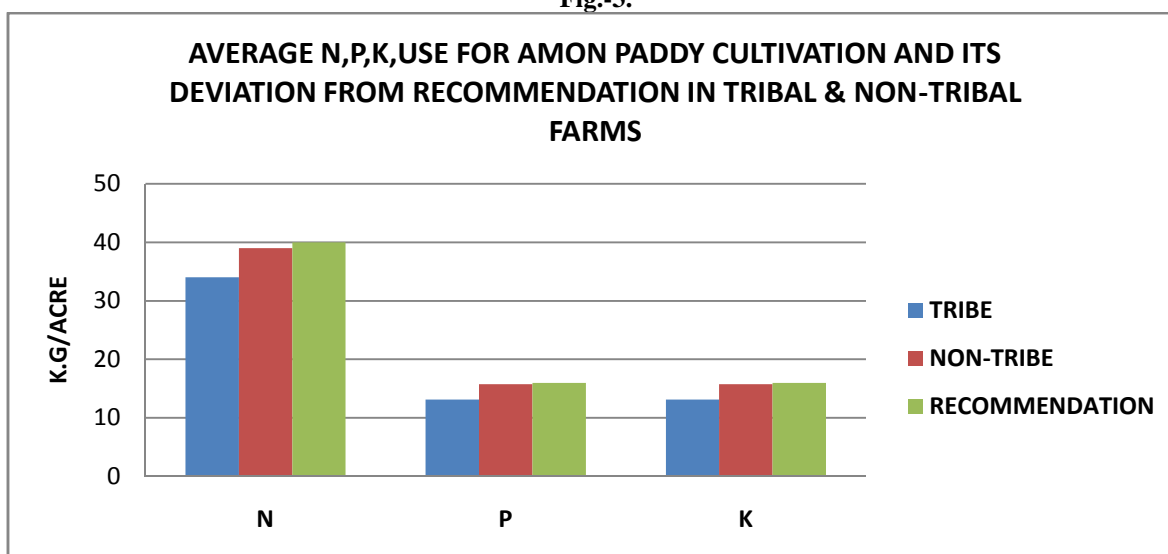


Fig.-4.

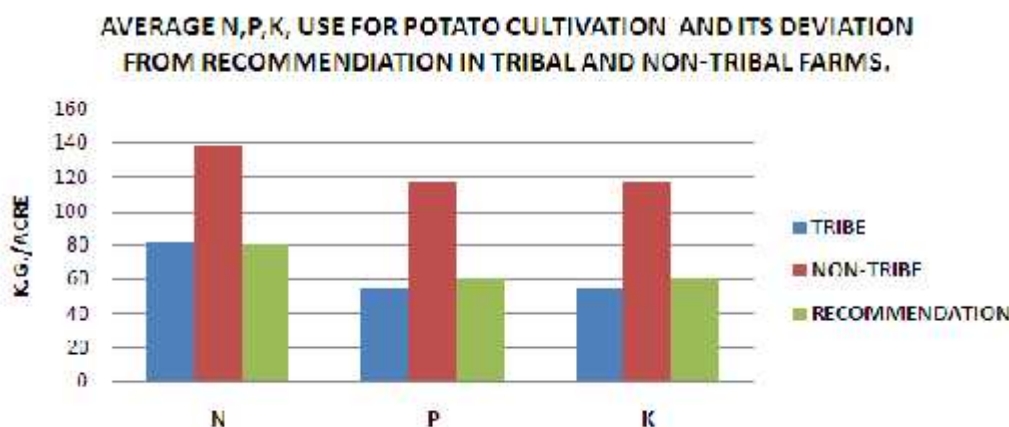
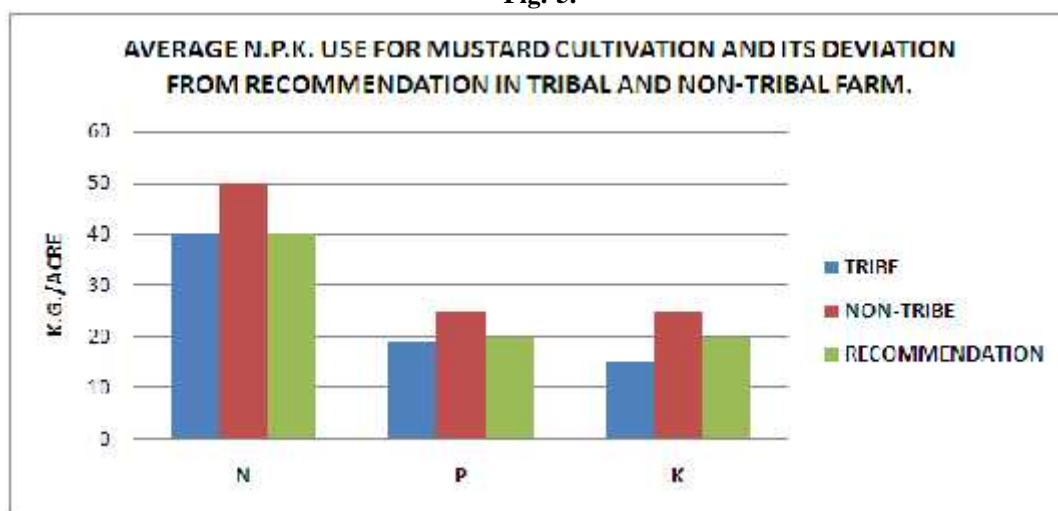


Fig.-5.



### III. Conclusion

Tribal agricultural practice is not far laggard than non-tribal practice in the South Bankura, West Bengal but there are so many differences which have been observed in this intensive field based study. Traditional pattern of agricultural practice is going to change day by day through modern seeds, new varieties of bio and chemical fertilizer, new pesticides and introduction of other small agro technologies. The pattern of commercialization is also changed significantly by expansion of market due to improved road transport. Tribal indigenous knowledge lagging behind with this advancement due to lack of proper scientific knowledge. Though there is a considerable influence of non-tribal farmer on tribes particularly in this region. In this paper cropping intensity, Soil fertility and fertilizer usage are analysed in detailed. Everywhere we have seen a gap between tribes and non-tribes. Non acceptance of modern knowledge low aspiration in life and lack of investment arrested the development of tribal agriculture. In one hand low yield of production and on the other loan from money lenders compress farmer's life from both side resulting further low yield and poor farmers rotated around a poverty circle. Not only in tribal society but it is also true for small non-tribal farmers.

Though the agriculture of this region is mainly subsistence in nature but Potato, Mustard, Sunflower, Sesame crops are in Rabi and Pre Kharif season is highly commercialized. Over utilization of fertilizer is observed in the field of said crops particularly where cropping intensity is high like Gargaria G.P in Sarenga Block and Mondalgram G.P in Simlapal block resulting soil acidity and other numerous qualitative and micro-biological problem in the soil.

For searching a sustainable and more profitable agriculture Department of Agriculture, West Bengal Government and Researchers/NGOs should be worked together. We are hopeful because there is a wide gap between potentiality and actual amount production. So there is a great scope to develop the agricultural landscape by some basic infrastructural and perceptual change.

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