Case Study Available online www.ijsrr.org ISSN: 2279–0543

International Journal of Scientific Research and Reviews

Changing Agricultural Resource and Agricultural land use Pattern Through Time by Time: A Critical Case study of Egra-I and Egra-II Block in Purba Medinipur, West Bengal

Duari Bimal

PhD Research scholar,Dept. of Geography, Seacom Skills University, Bolpur,WestBengal

ABSTRACT:

Resource is the most dynamic in nature. Geographical paradoxes of nature and human needs base resource function ability are the most significant parameter for resource dynamic. In this concept agricultural resource are the important and demandable primary economic activities for economic development. The primary economic activity base agricultural resource and agricultural land use are continuous dynamic through time by time. Some physical parameter and socioeconomic parameter are determined for dynamic change of agricultural resource and agricultural land use. In study area, Egra block-I, Egra block-II of Purba Medinipur (W.B.) as a coastal area where the agriculture and agricultural land use practice rapidly change day by day. Mainly food crops field are highly converted and dynamic change in to commercial crops field. Some geomorphic determinism and socio economic determinism are the main force full factor for this resource dynamic change.

KEYWORDS: Agricultural land use, Geomorphic Determinism, Socioeconomic change, Resource dynamic

***CORRESPONDING AUTHOR**

Bimal Duari

PhD Research scholar,Dept. of Geography,

Seacom Skills University, Bolpur,WestBengal

Email:bimalduari66@gmail.com, Mob. No. : 9614984324

INTRODUCTION:

Resource creation process is dynamic in nature. Resource based land use are the most highly dynamic nature. Human needs base resource function ability and physical parameter base resource possibilities are the mo dynamic through day by day. Paradoxes of nature and geographical distribution of natural endowments are the related with geomorphic determinism on a particular area. Other side man-culture base resource production, use and management are the most dominant parameter for resource creation, also resource dynamic. In this concept agricultural resource is the important and demandable primary economic activity2. The primary economic activity base agricultural resource and agricultural land use are continuous dynamic in study area. Egra block-I, Egra block-II of Purba Medinipur (W.B.) as a coastal area where the agriculture and agricultural land use practice rapidly change day by day. Mainly food crops are highly converted and dynamic change into commercial crops.

LOCATION OF THE STUDY AREA:

Egra block Iand Egra block II of Purba Medinipur,W.B are located on latitudinal extension 21°30’25’’N-21°45’N and longitudinal extension 86°45’E-87°45’E.Geomorphologically this area located in a part of’Digha –Kanthi’ coastal plain, that which lower part of coastal tract inWest Bengal. On the other hand this study area situated under the ‘Dubda basin’ at lower part of Rasulpurriver. Coastal alluvial and older alluvial plain covered with allover the study area during the Quaternary period of geological time scale, Geomorphic process base sandy ,and sandy-loamy soil are formed due to long term of weathering, erosion and depositional process on during time. Egra block I consistence of 8 rural gram- pachayats and Egra block II consistence of 8 rural grampachayats. Total geographical study area is 40106.1sq Hector.

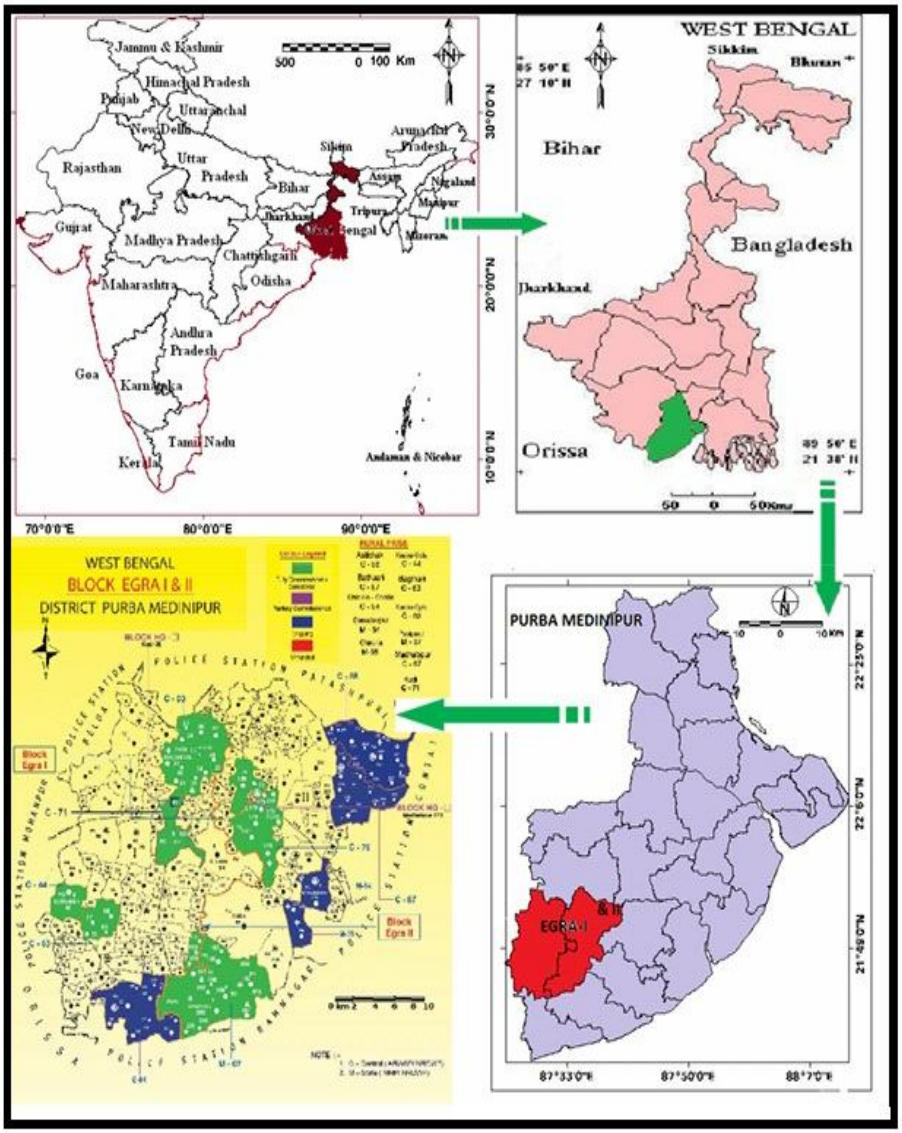

Figure 1 Location Map of the Study Area

REVIEW OF LITERATURE:

Ahmed et al (2016) in his research article studied about the land use/land cover (LULC) changes over the last two decades in a watershed (9589 ha)located in semi-arid eco-region in South India (Anantapuram district) using Landsat and IRS imagery and captured additional data through field observations[1].

Birthal (2010) in his paper attempted to identify and quantify the sources of agricultural growth in India's northeastern states. The study based on the secondary data cover the period from 1991-92 to 2003-04. The data used in the study has been compiled from various sources like Indian Agriculture Statistics, Statistical Abstracts of India and State[2].

Chad (2010) in his paper attempts how agricultural scenario would evolve in the near future and what policies and strategies would be appropriate to adjust to the emerging changes and to harness the new opportunities. This paper is an attempt towards preparing a vision for agriculture for the SAARC countries towards 2020[3].

Dongdong et al (2011) in his paper applied multiple end member spectral mixture analysis to interpret Landsat satellite imageries and then analyzed the spatiotemporal dynamics of agricultural landscapes within Hangzhou metropolitan region[4].

Gautam and Webbin (2014) in this study analyzed spatial and temporal changes in land use/land cover in a typical mountain watershed covering an area of 153 km2 in central Nepal by comparing classified satellite images from 1976, 1989 and 2000 coupled by GIS analyses and also investigated changes in the shape of land use patches over the period[5].

Khan and Ma(2009) in his paper provides a comprehensive review of literature related to the assessment of climate change impacts on crop productivity using climate, water and crop yield models.

Msangi and Rosegrant (2009) in this paper explore the nature of several key drivers of change in food systems, and examine a number possible entry points for policy intervention, in order to determine their effect on food prices and other market driven outcomes[6].

OBJECTIVES:

- **i.** To study the geomorphology and geomorphic aspect of study area
- **ii.** To study the land use pattern of study area.
- **iii.** To study the agricultural resource production on study area.
- **iv.** To study the geomorphic determinism of agricultural practice on study area.
- **v.** To study the dynamic changing pattern of agricultural resource production for development.
- **vi.** To the study dynamic change of agricultural land use base problem.
- **vii.** To study the planning aspect on study area.

METHODOLOGY:

In the present research work including with geomorphic analysis. Geomorphic terrain, slope base drainage alignment, soil structural-textural characteristics etc. analyzed into qualitative and quantitative approach. Literature survey, census survey, climatic data study topographical map study and administrative map-data study along with pre fieldwork. Fieldwork related with intensive field survey

along with physical and socio-economic parameter base land use survey and perception survey on study area. Post fieldwork related with geographic techniques base measurement and analysis through qualitative and quantitative approach.

HYPOTHESES:

H1: Geomorphic terrain base flood effected problem and its impact on agricultural land use and agricultural resource.

H2: Changing land use pattern due to geomorphic pedological aspect on study area.

H3: Food crops base agricultural field rapidly change into commercial crops field on study area.

RESULT AND DISCUSSION:

Geomorphology and Geomorphic Aspect on Study Area:

Geomorphologic ally the study area cover with Purba Medinipur coastal tract. Coastal alluvial and older alluvial base sandy sandy loamy soils are occupied this area. 75% area is cover and determine by 'Dubda basin'. Surface elevation refer the 0m to10m above the mean sea level and Gentle slope (>10°). Formation is the most important parameter of this area. Other hand seasonal flooding are occupied this region. So Egra Block-I and Block-II geographical area's terrain morphology is determine by coastal morphology and coastal base seasonal flooding. Agriculture are the most common economic activity of this area's population, but this agriculture base resource and agricultural land use are mostly seasonal determine. So man have change his agricultural practice, that effect agricultural land and agriculture resource dynamic.

Resource Base Agriculture and Land Use Study:

Egra block-block-II and I are the coastal base resource producing area, where coastal alluvial and older alluvial land occupied by sandy, sandy loamy and loamy soil cover. Total geographic region are mostly cover with agriculture related economic activity. Food crop, commercial crop, plantation crop, horticultural crop and water base aqua culture are placed of this region (Figure 2). But recent trends of agriculture base resource are dynamic change of food crop to commercial crop. Because geographic terrain seasonal flood and soil textural composition are not favorable for food crop (rice) agriculture.5 So habitat people are rapidly change (dynamic change) of his agricultural practice (table-1 and table-2) .This effect food crop field are dynamic change to commercial crop (Groundnut, Mustard oil seeds, Til etc)

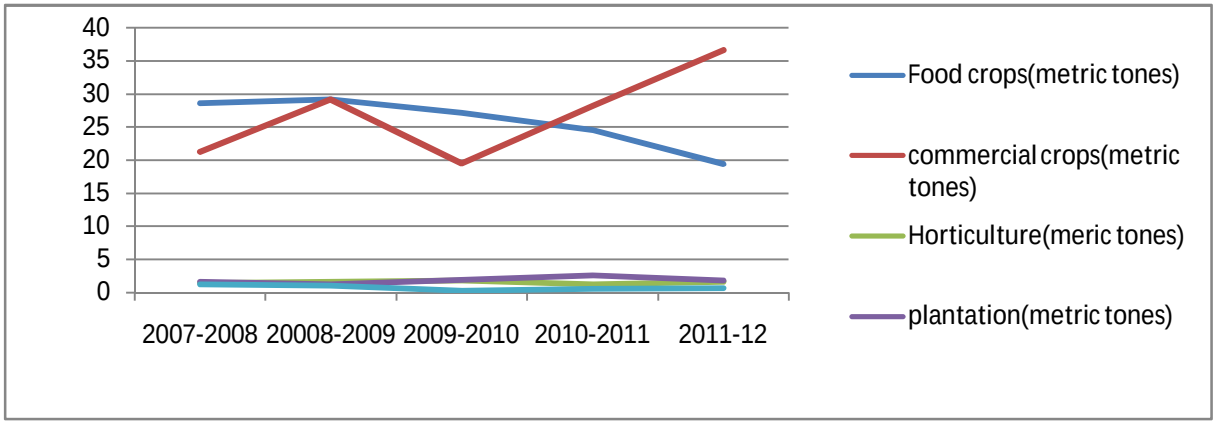

Figure 2 Status of Dynamic Change of Agricultural Resource Production 2008-2012 .Data source: Office of Asst. Director of Agriculture, Egra Block-l, Purba Medinipur.

Table-1 General land use and cropping pattern in study area-(Block-l) 2011-12

JL NO.	Gram Panchayat/ Municipality	Geographical Area inHector	Net Croppedarea(hector	Agricultural resource and Land Situation (area in hector)			
				Plantation AndHorticulture	Commercial crop area	Food crop area	Aqua culture and others
1	Barida	2856.8	2273.2	223.2	1676.0	302	72
2	Kosba Egra	784.0	477.6	0.6	347.0	125.0	25
3	Chhatri	2611.6	2206.0	66.0	487.0	1332.5	320.5
4	Jerthan	2677.6	1939.6	66.0	1642.2	189.6	41.2
5	Panchrole	2447.2	1955.2	110.2	1215.0	399.0	231
6	Sahara	2666.8	1860.0	63.0	1265.0	350.3	181.7
7	Rishi bankim	2652.4	2085.2	80.2	1301.0	382.9	321.1
8	Jumki	2871.2	2293.2	37.2	1041.0	1054	161
9	Egra Municipility	1911.6	1160.4	3.4	921.8	205.9	29.3

Source: Office of Asst. Director of Agriculture, Egra Block-l, Purba Medinipur.

Table-2 General land use and cropping pattern in study area(Block-II)2011-12

JL NO.	Gram Panchayat/ Municipality	Geographical Area in Hector	Net Cropped area(hector)	Agricultural resource and Land Situation (area in hector)			
				Plantation and Horticulture	Commercial crop area	Food crop area	Aqua culture and others
1	Deshbondhu	2354.44	2215.67	319.5	831.6	939.7	124.87
2	Bathuary	2964	2258.71	271.6	753.7	1012.7	220.7
3	Vivekananda	2361.69	2143.90	166.5	910.5	996.5	70.4
4	Manjushree	2453.25	2317.22	115.0	1074.7	994.5	133.02
5	Paniparul	2579.75	2361.59	310.2	918.9	1075.7	56.79
6	Dubda	3129.34	2680.76	313.7	826.8	996.5	543.76
7	Sarbodaya	1356.00	1242.63	80.2	449.7	632.7	80.03
8	Basudev pur	1428.43	1398.84	91.8	539.5	710.7	56.84

Dynamic Change of Agricultural Resource Production:

Recent and previous statistics of agricultural resource are shown that year and hector wise food crop production are reduced but commercial food crop production are increase6. So rapidly changed of agricultural resource practice and production. It says that a farmer is not satisfied of food crop (rice) cultivation than the commercial crop (Groundnut, Mustered oil seeds, Till etc.) cultivation (Table-4). As a background some geomorphic determinism, seasonal flood, Not favorable soil textural composition of the study area. Push factor (Reduction of food crop cultivation) and pull factor (increases of commercial crop cultivation) are showing bellow (Table-3)

Table-3 Comparative study of Food crop cultivation (Rice paddy) and Commercial crop cultivation(Groundnut):

Food crop cultivation(Rice paddy) in 1Acre			Commercial crop cultivation(Groundnut) in 1Acre		
Cultivated related expenditure (in 1 Acer)	Amount	Rupees	Cultivated related expenditure (in 1 Acer)	Amount	Rupees
Seeds of rice paddy	35kg	1200	Seeds of Ground nut paddy	55kg	5500
1st Drilling process for transplantation		100	Drilling process		1200
Transplantation process		250	Fertilizer(N.P.K)	50kg	1100
Fertilizer (N.P.K)	11kg	250	Micro nutrient	5kg	180
Pesticide (Saff, Upl comp.)		80	Fertilizer(patus)	23kg	500
2nd Drilling process for plantation		900	Herbicide (Pendimithile)	1.5liter	600
Fertilizer (N.P.K) apply on Drilling time	30 kg	600	1st Spray- Carbandisum and Herbicide	250g 300ml	140 80
Herbicide (Pendimithile)	500 ml	100			
Fertilizer (N.P.K) apply for plant growth	20kg	400	Fertilizer(N.P.K) apply for plant growth	30kg	700
1st Spray- Carbandisum and Herbicide	300 g 300ml	150 150	2nd Spray- Carbandisumand Herbicide	250g 300ml	140 150
2nd Spray-Hexagonan and Herbicide	300ml 300g	150 150	Micro nutrient	5kg	180
2nd Fertilizer (N.P.K) apply for plant growth	14kg	300	3rd Spray-Boron and Hexaconazole	30g 300ml	70 100
3rd Spray (Tricyclolijol-Beam)	150g	180	4th Spray-Assataf, Carbandisum and	300g 300g	150 140

			Hexaconazole	300g	130
4th Spray (Acifate-Conifidor)	100ml	400	Thaimate	8kg	450
Labour	45person	9000	Labour	40parson	8000
Water		6000	Water		4000
TOTAL		20360	TOTAL		23510
PRODUCTION and MARKET VALUE(1000/1Quental	25-28Quental	25000-28000	Production and Market Value (3500/1Quental	20-25Quental	70000-87500
PROFIT		4640-7640	PROFIT		45000-50000

Source: A.D.A office survey, perception survey and field survey.

Push factor (Reduction of food crop cultivation):

Seasonal flood, Sandy soil coverage, Low rate of production, High rate of labour involved, Labour cost high, Decreasing Marketing rate of Rice paddy, Problem of mechanization and equipment, Not accessibility of road for crop plants carries, Increasing of transport cost (heavy materials), Not support of agricultural lone, Insurance store rooms etc, Extensive time involved, lake of labour input, High cost of Fertilizer, seeds and pesticide etc.

Pull factors (increases of commercial crop cultivation):

Favorable season of winter for commercial cultivation, Sandy and loamy soil coverage, High rate of production, Few rate of labour involved, Favorable condition for short term of mechanization and equipment, Only collected grain carry, Not heavy materials, Short time involved crop cultivation, Small level use of fertilizer, seeds and pesticide, Favorable for income level, Market price rate is high, No needed for storage of crops, Economic benefited than the food crops, Directly and indirectly maximum no. of employment person on commercial crop, Low level risk of commercial crop than the food crops cultivation 9,10. Table-3.

Table-4 Flood as a geomorphic determinism on agricultural land use base resource dynamic change:

Year	Net cultivated area in Hector	Agricultural resource and land use effected area in percectage		
		Boro cultivation	Aush cultivation	Aman cultivation
2007-2008	33140.42		40-50	50-60
2008-2009	32900.43		20-30	
2009-2010	32859.76	5-10	20-25	20-25
2010-2011	32861.72	10-15	20-25	20-30
2011-2012	32854.36		30-40	10-20

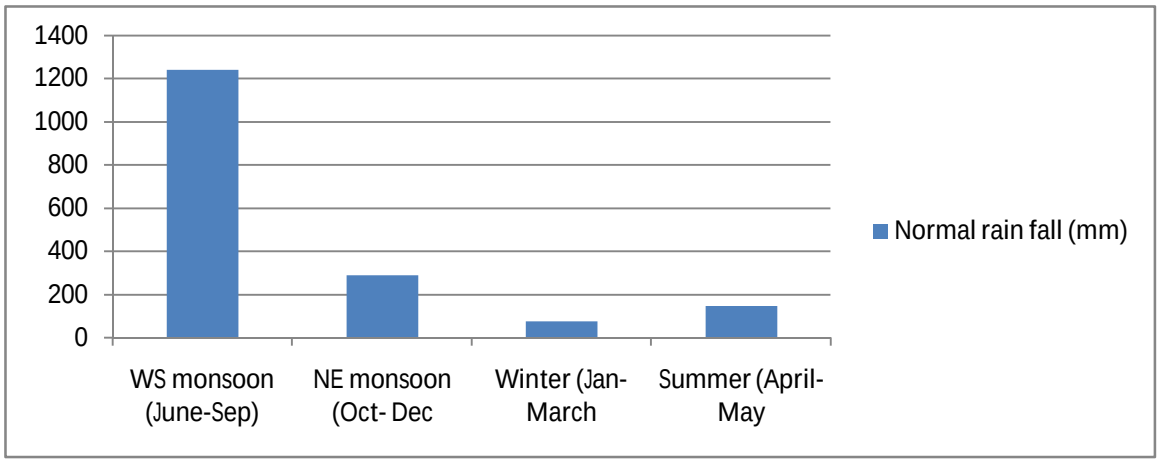

Figure 3 Normal Rainfall

Table-5 Pedpalogical Determinism on Agricultural Land use Base Resource Dynamic Change

Study area	Soil Type(textural composition)			Pore space	Water Holding Capacity	Favorable for rice cultivated area	Favorable for Ground nut Cultivated area
	Sandy soil	**Sandy loamy soil**	**Loamy soil**				
Egra block -I	20%-30%	40%-%50%	30%-40%	50%	Low to Medium	30%-40%	60%-80%
Egra block - II	30%-40%	40%-%50%	20%-30%	40%	Low to Medium	20%-30%	50%-60%

Dynamic Change Related Impact Base problem: Some physical and Socio-economical determinism and possibilities are the vital key of dynamic nature of coastal agriculturalresource.Some important negative impact creates due to dynamic change related problem, these are- 1.Food crop crises 2. Land use, agricultural practice and socio cultural habit change 3.Death for snake attack .4. Monkey effect problem.

CONCLUSION:

From the above analysis is clear that the dynamic change of agricultural and use and agricultural resource. So various type of problem arise of this study area, that which shown above points. Firstly, some recommendation for food crop crisis. It is large scale problem for primary needs as a food. This problem recommended by the following point of planning and suggestion

1. To do the seasonal base cultivation work food crop and commercial crop cultivation through the modern techniques apply.

2. High yielding crop cultivation apply.

3. March-June month avoid base food crop cultivation apply.4. Protection offlooding effect on agricultural activity.

5. Management program for flood problem on agricultural land use and agricultural resource. Secondly, as a problem of socio-cultural habit changes. So some recommendation for social stability, that is –To do the motivated of cultivators (farmer) for various type of food crop related commercial activity on crop relax season time, as a example of 1.Commercially rice to rice pappy processing.

2. Rice paddy to fry-rice process. 3. Rice paddy to flatten and friend rice processing. Thirdly, the problem is snake attack and death of human society. As a commercial crop field is highly

Covered with jangle environment, so various type of poisonous snake are habited in this field and effect on human society. So some recommendation for this effect- 1. Strictly consciousness

2. Protective dress use on field 3. Highly techniques apply on commercial crop field.4. Protective medicine supply for diagnosis. Forth, the some recommendation for Monkey effect

Problem of this study area, this are- 1. Strictly consciousness and controlling act for monkey effect.2. Crop rotation and crop cultivation change year by year (seasonal). Lastly, all over convince and inform of all agriculture engaged people for the equal approach apply on food crop cultivation and commercial crop cultivation.

REFERENCES:

1. Ahmed et al .Land use and agricultural change dynamics in SAT watersheds of southern India, Current Science, 2016;110:1702-1708
2. Birthal P: “Unlocking the Potential of Agriculture in North Eastern Hill Region of India”, Indian Journal of Agricultural Economics, 2010;65:329-343
3. Chand R. “SAARC Agriculture Vision 2020”, Agricultural Economics Research Review, 2010; 23:197-208
4. Dongdong et al. Dynamic Pattern of Agricultural Landscapes in Response to Urbanization across Hangzhou Metropolitan Region: A Remote Sensing Approach, International Conference on ICCE, Wasington 2011;111: 467-470

5. Gautam and Webbin. A Land use dynamics and landscape change pattern in a mountain watershed in Nepal, Agriculture Ecosystems and Environment, 2003;99:83–96
6. Kang Y, Khan S.Climate change impacts on crop yield, crop water productivity and food security – A review, Progress in Natural Science ,2009; 19:1665–1674
7. Msangi S and Rosegrant M.World Agriculture in Dynamically -Changing Environment FAO Expert Meeting on How to feed the World in 2050, 2009;122:1-16
8. De. N.K. and Jena, N.C. The land Multifacted Apprasal and management - Shribhumi Publishing Company,Calcutta, 1977: 18-36
9. Singh R.P., Geo mophological evolution of Chota nagpur High lands, New Delhi 1958: 42-71
10. Dracup JA, Vicuna S. An overview of hydrology and water resources studies on climate change: the California experience. Copyright ASCE 2005; 1–12.